

Finding the best place for Vegetarian Restaurant in Toronto

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Introduction

- **Toronto is one of the most densely populated areas in Canada with an estimated population of over 6 million.**
- **Toronto is in the world's top five world's cities that are the most vegan and vegetarian friendly.**
- **Develop machine learning model to find the best place to open vegetarian restaurant**

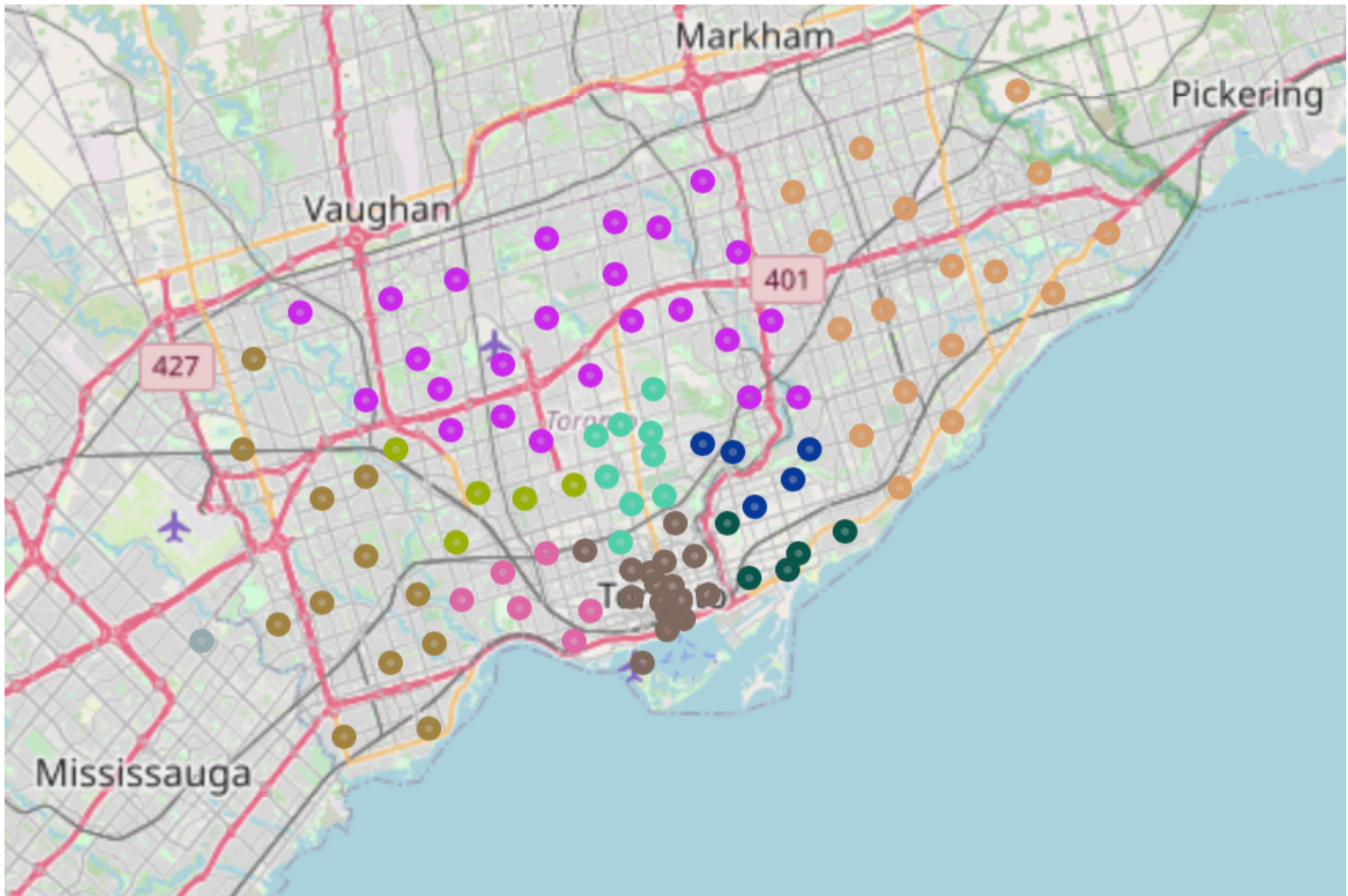
Data

- 1)List of neighborhoods in Toronto (via Wikipedia)**
- 2)The Geographical location of the neighborhoods**
- 3)Venue data pertaining to Vegetarian Restaurants (via Foursquare)**

ANALYSIS OF THE DATA

List of neighborhoods with their Location

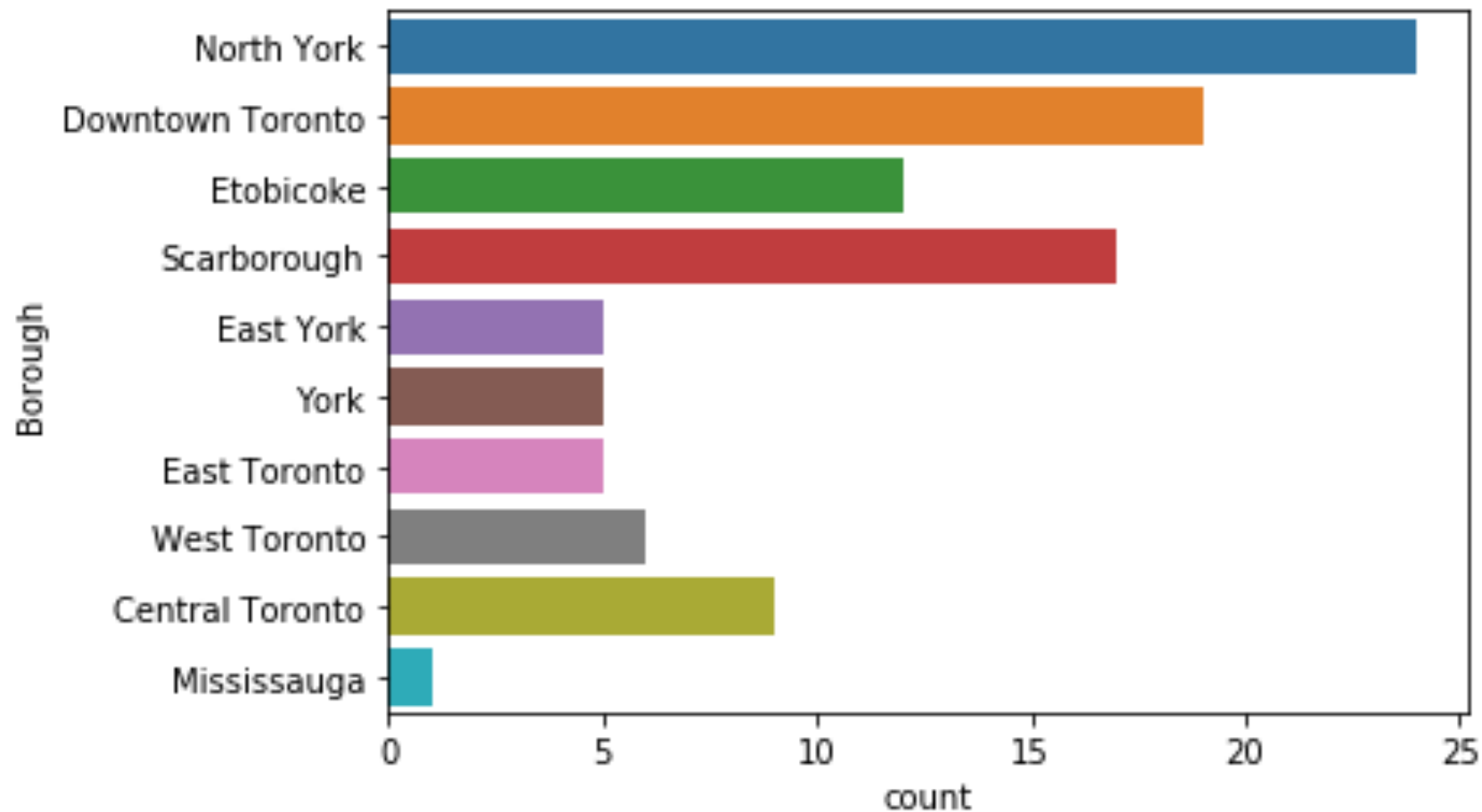
	Borough	Neighborhood	Latitude	Longitude
0	North York	Parkwoods	43.753259	-79.329656
1	North York	Victoria Village	43.725882	-79.315572
2	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
3	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763
4	Downtown Toronto	Queen's Park, Ontario Provincial Government	43.662301	-79.389494



ANALYSIS OF THE DATA

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ANALYSIS OF THE DATA

List of all the Venues in Toronto using the Foursquare API

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Parkwoods	43.753259	-79.329656	Brookbanks Park	43.751976	-79.332140	Park
1	Parkwoods	43.753259	-79.329656	Variety Store	43.751974	-79.333114	Food & Drink Shop
2	Victoria Village	43.725882	-79.315572	Victoria Village Arena	43.723481	-79.315635	Hockey Arena
3	Victoria Village	43.725882	-79.315572	Tim Hortons	43.725517	-79.313103	Coffee Shop
4	Victoria Village	43.725882	-79.315572	Portugril	43.725819	-79.312785	Portuguese Restaurant

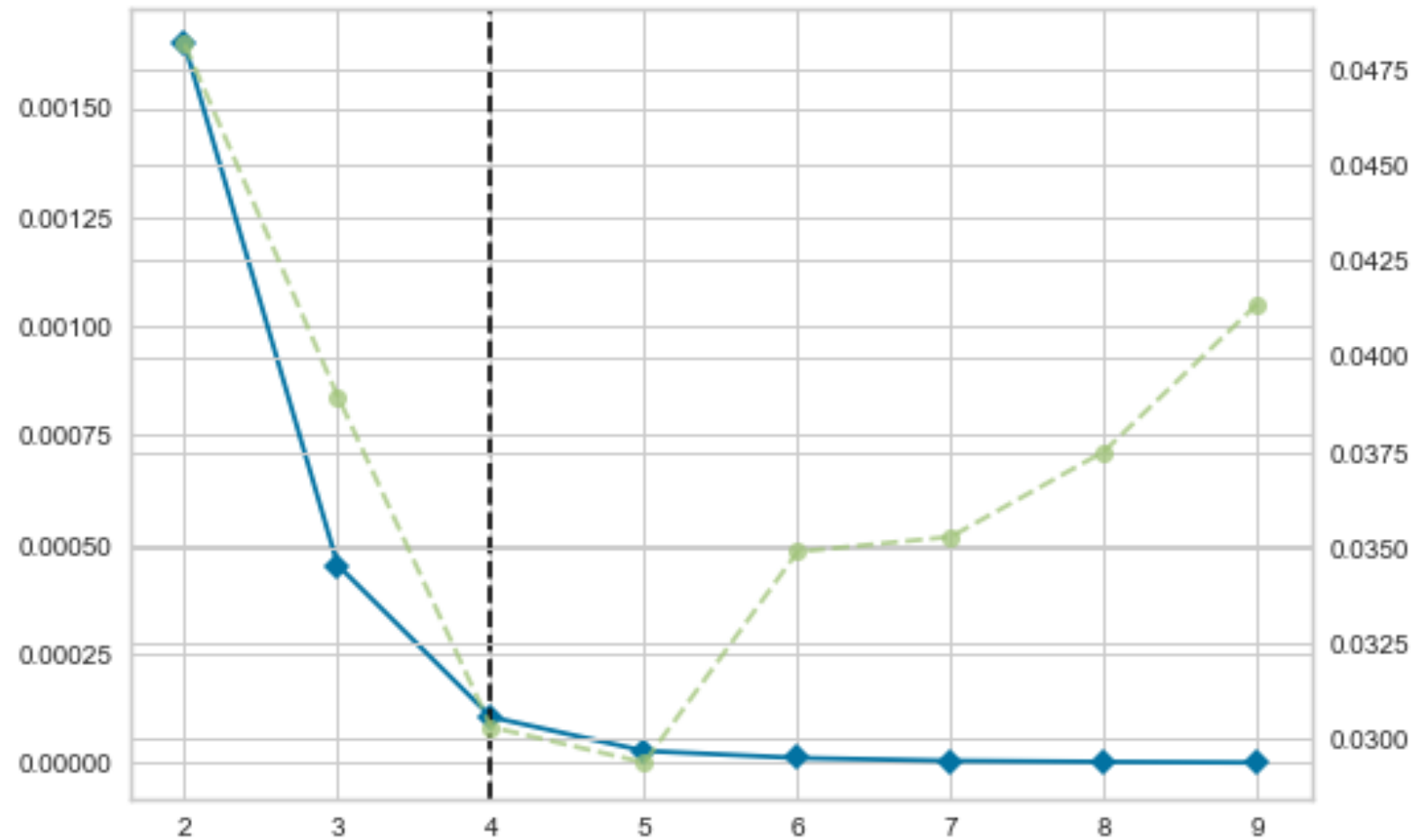
Machine Learning Models

- 1) Using one hot encoding technique
- 2) The mean frequency of vegetarian restaurants in each Neighborhood

	Neighborhoods	Vegetarian / Vegan Restaurant
0	Agincourt	0.000000
1	Alderwood, Long Branch	0.000000
2	Bathurst Manor, Wilson Heights, Downsview North	0.000000
3	Bayview Village	0.000000
4	Bedford Park, Lawrence Manor East	0.000000
5	Berczy Park	0.018182

Machine Learning Models

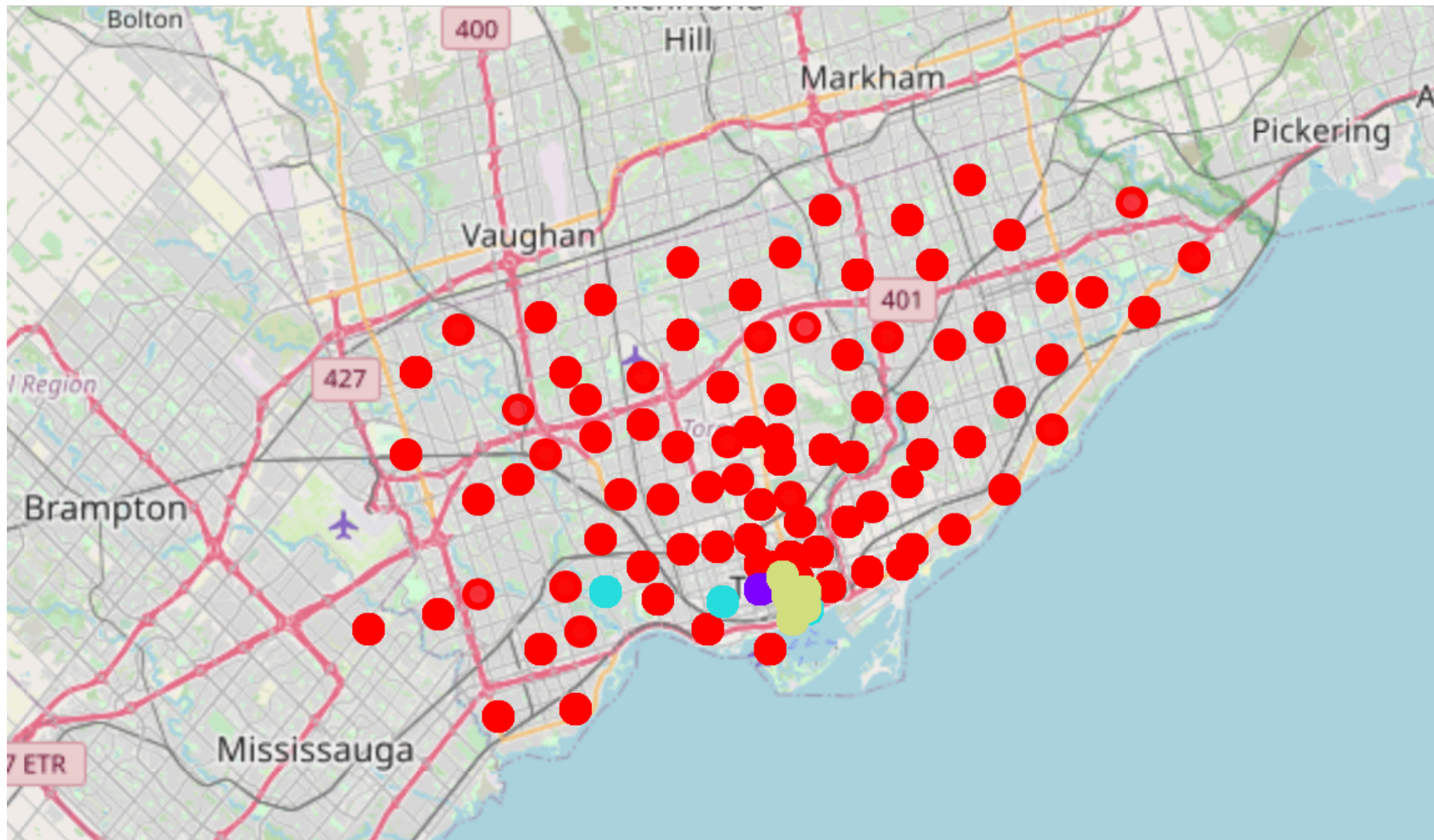
K-means clustering



The best K=4

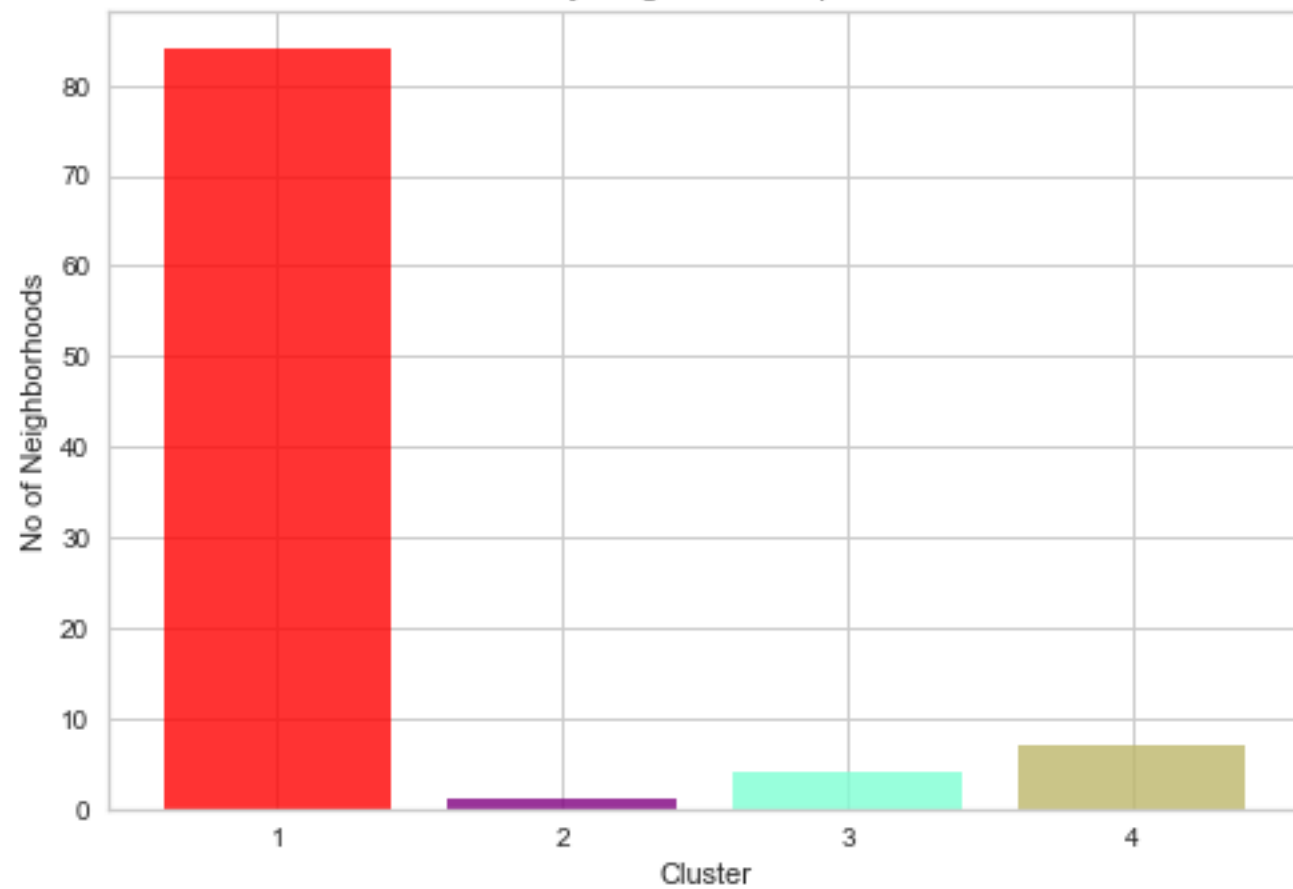
Result

Each neighborhood based on the cluster label

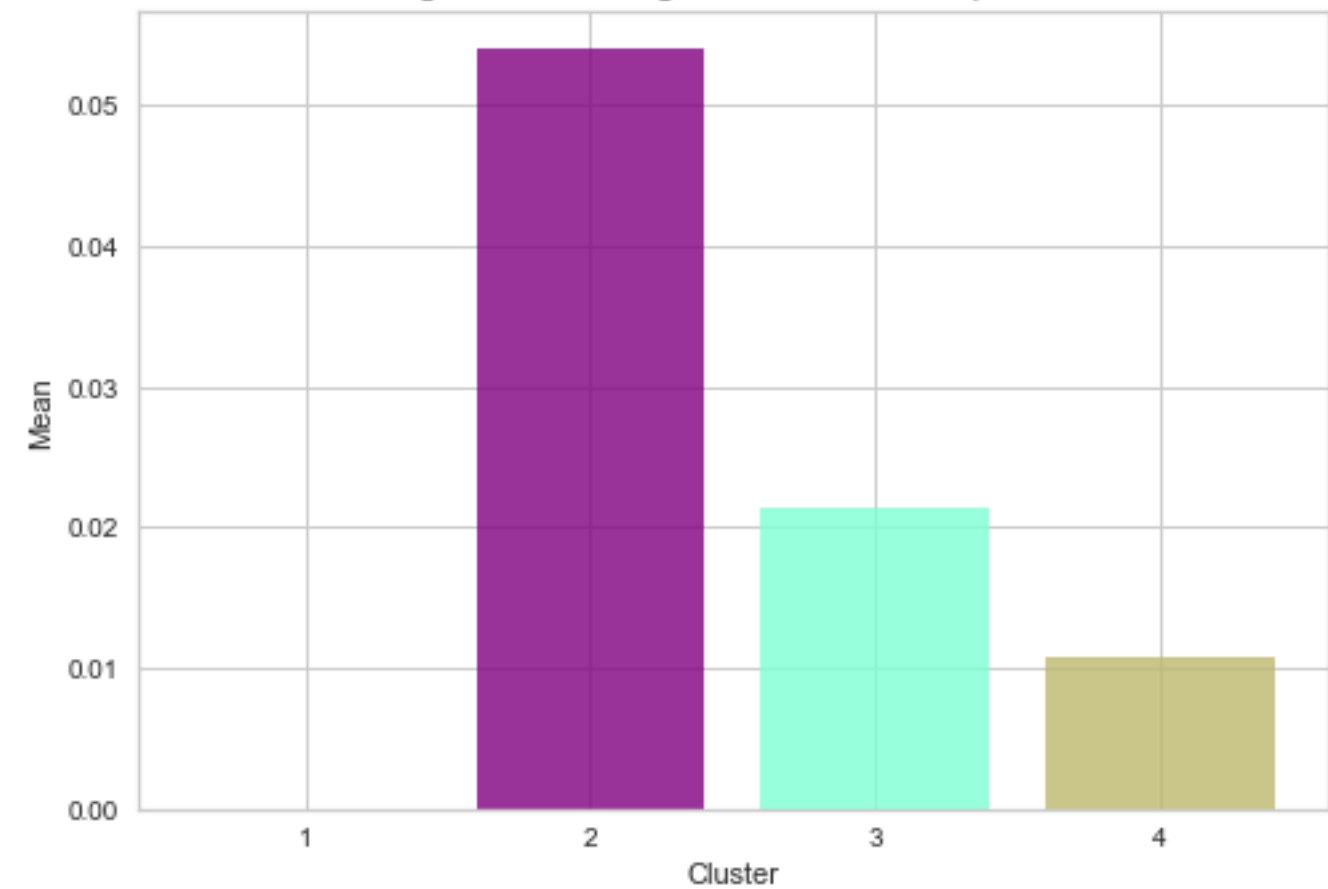


Result

How many Neighborhoods per Cluster



Average number of Vegetarian Restaurants per Cluster



Conclusion

The optimum place to open a new Vegetarian Restaurant is neighborhoods in cluster 1 which there are many Neighborhoods in the area but no Vegetarian Restaurants, therefore, eliminating any competition.

- **More data needed**
- **include new features to the models such as tip, rate**